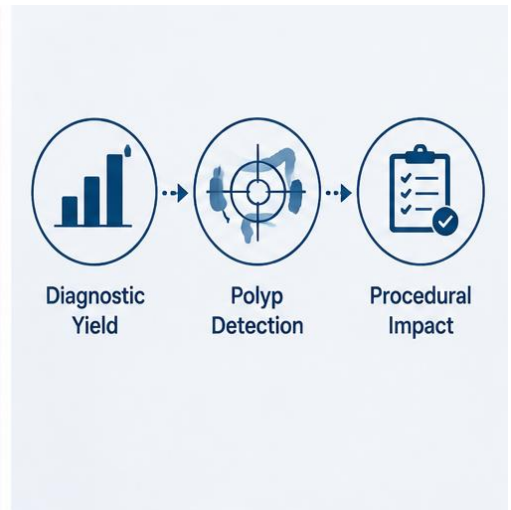
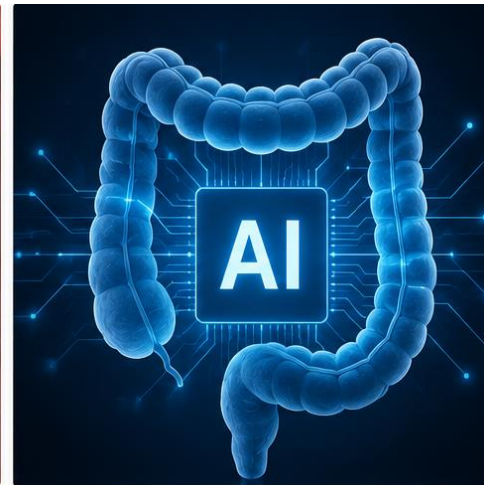
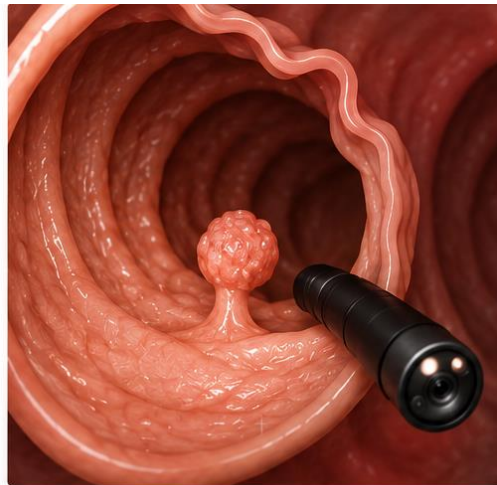
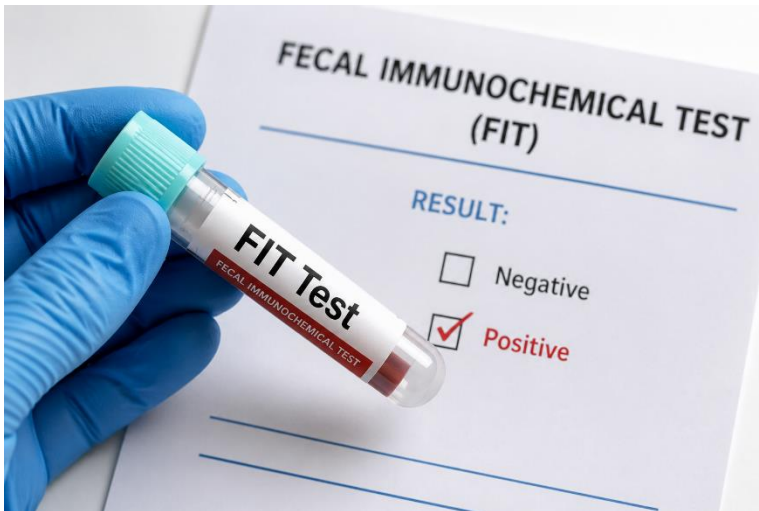


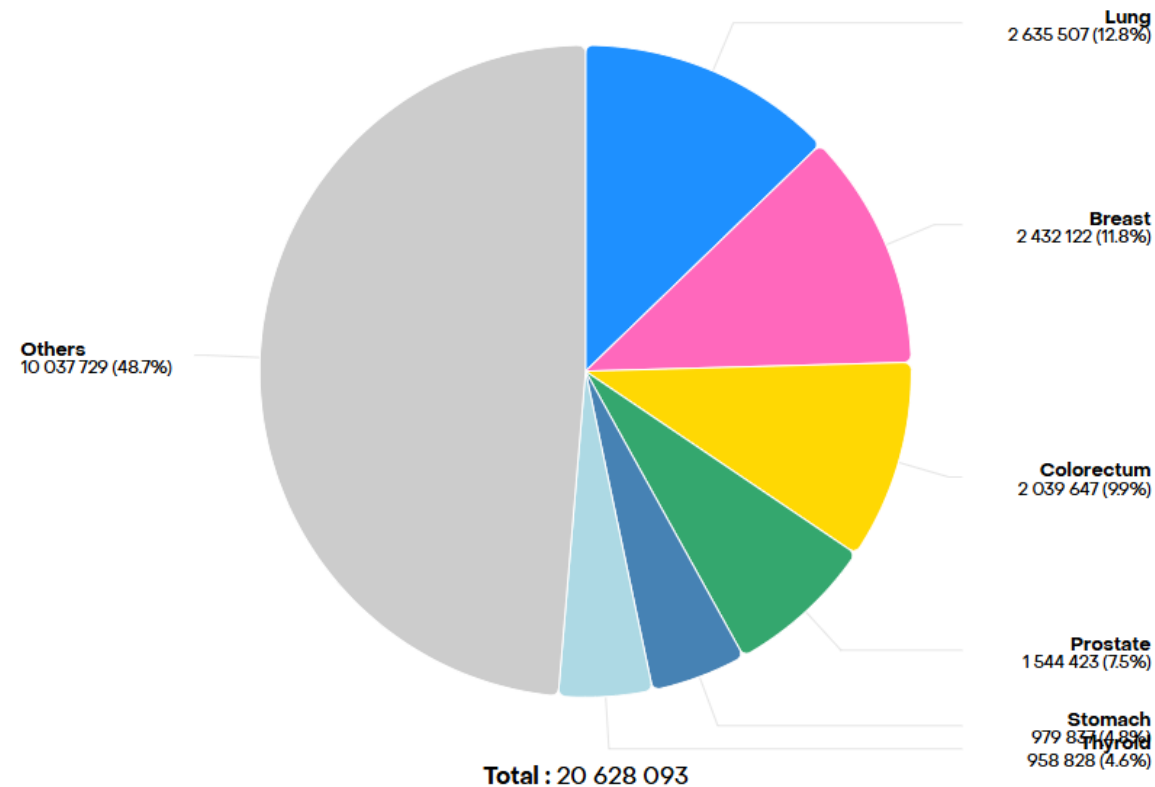
Diagnostic Yield and Procedural Impact of Computer-Aided Detection in FIT-Positive Colonoscopy: An Updated Meta-Analysis

Ali Ramadan, Ahmed Samy Gad, Omar Ashraf Eissa, Abdelrahman A.Hashem, Yasser Mohamed, Yasser Ashraf Gamal, Rofida Hamdy, Radwan Abdelsabour Torky

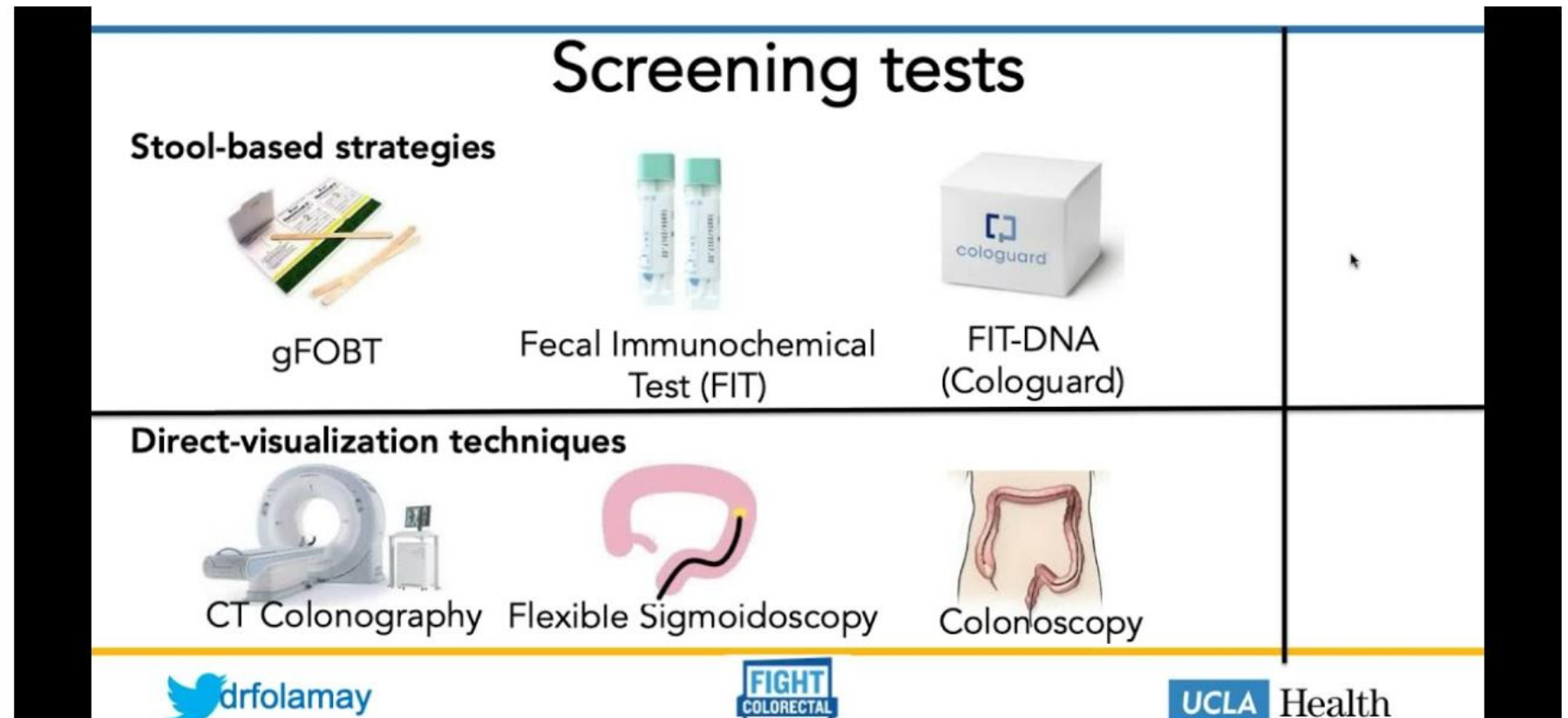


Introduction:

- Colorectal cancer (CRC) is the third most common cancer and the second leading cause of cancer death worldwide [1].

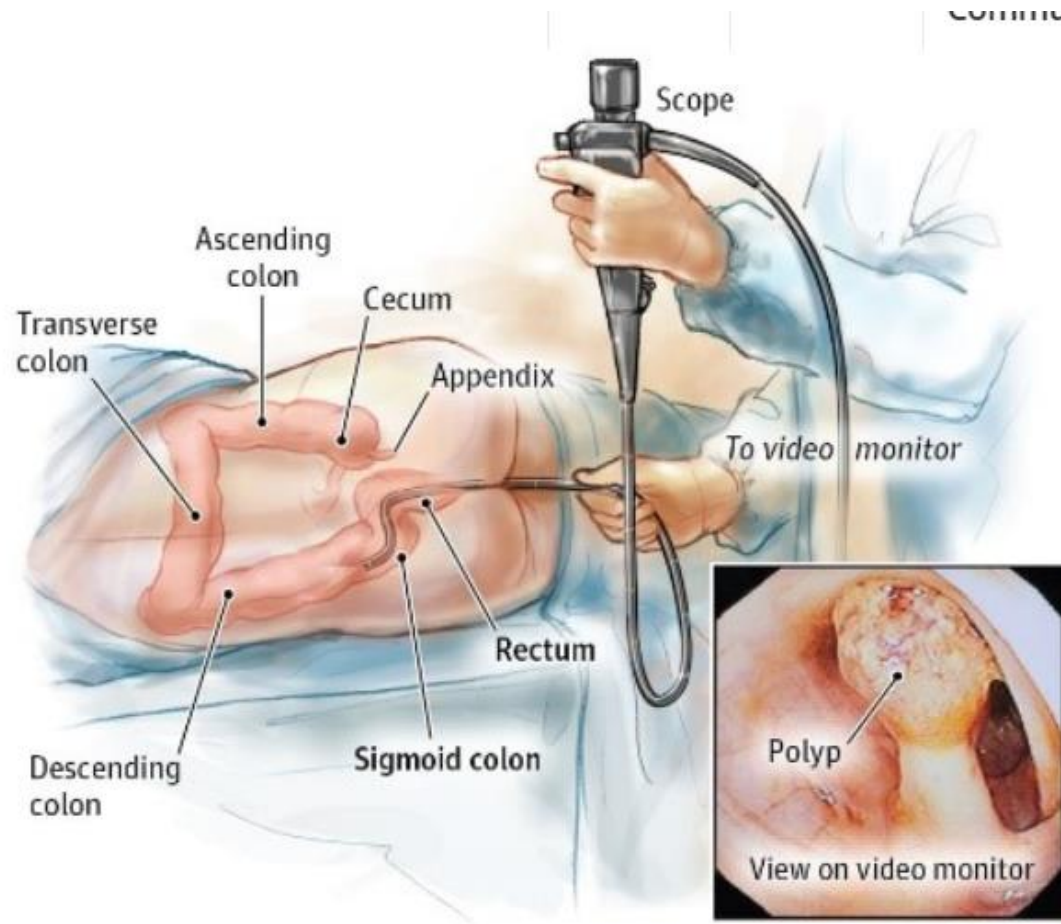


- Screening reduces the incidence and mortality of CRC[2,3].



from fawkesschool.blogspot.com

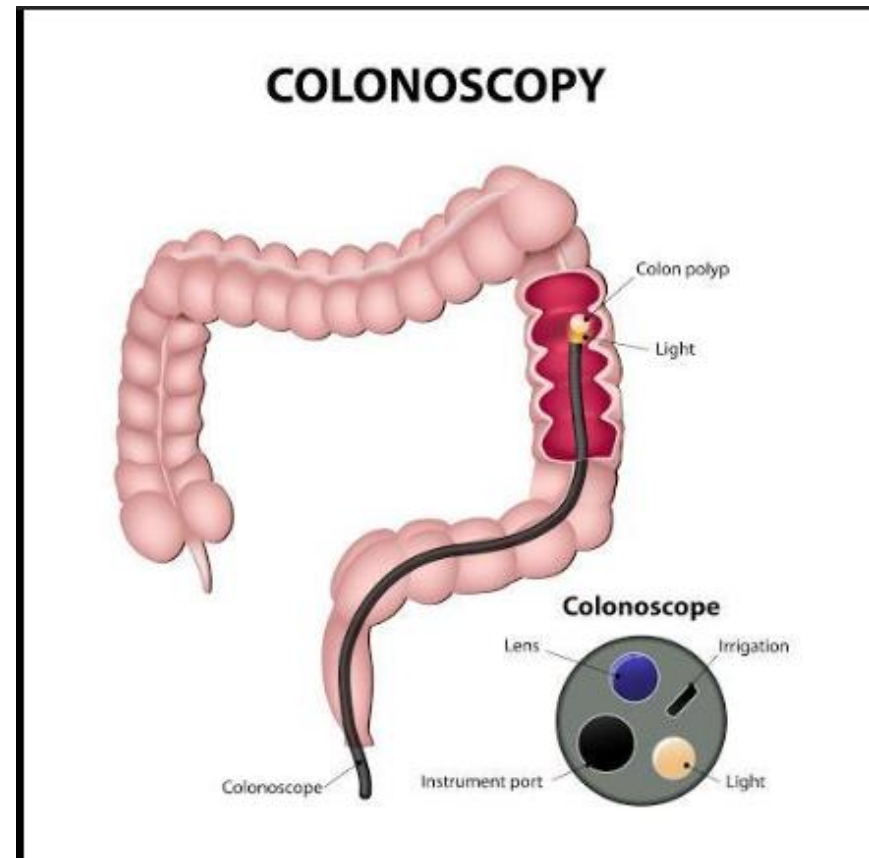
- Colonoscopy remains the gold standard for detecting and removing precancerous colonic lesions[4].



- The combination of fecal immunochemical test (FIT) followed by a colonoscopy has established itself as the preferred population-based screening strategy in Western countries and much of the Asia-Pacific region[5,6].
- The main reason why FIT+ patients may be considered the optimal population for an organized screening program is the expected high prevalence of advanced adenomas that are considered the principal reason for CRC progression[5,6].



- In FIT-positive patients, endoscopists' ability to detect advanced adenomas is closely linked to adenoma detection rate (ADR), a key quality indicator of screening colonoscopy. Given the association between ADR and the risk of interval colorectal cancer, improving adenoma detection is essential to enhance the effectiveness of CRC screening programs [5,6].



- So early detection through organized screening programmes, primarily based on faecal immunochemical testing (FIT) followed by colonoscopy, is pivotal for CRC prevention.



- Despite the growing number of randomized trials and meta-analyses evaluating AI in colonoscopy, including studies focused on FIT-positive evidence remains limited regarding the performance of the CAD EYE™ plat-form in FIT-positive colonoscopies within organized screening programmes [7] .
- Previous meta-analyses of computer-aided detection (CAdE) showed improved adenoma detection rates (ADR) but yielded conflicting data regarding advanced lesions and procedural time. With the availability of new randomized controlled trials (RCTs), an updated analysis is necessary to quantify the true effect size of CAdE in FIT-positive patients.

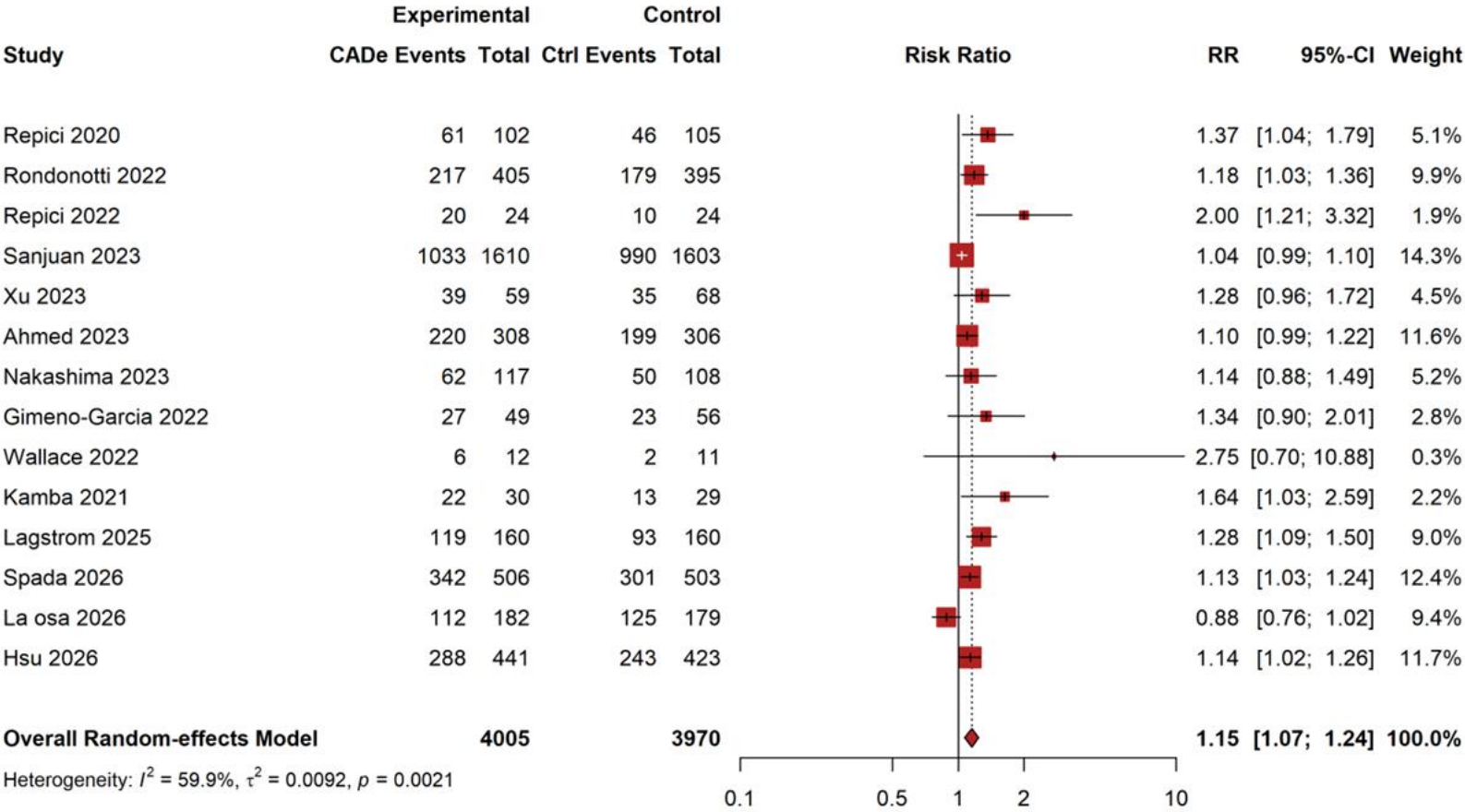
Purpose

- To evaluate the diagnostic yield and procedural parameters of CAdE in FIT-positive cohorts by conducting an updated meta-analysis of 14 RCTs FIT positivity included in analyses was 7975 (4005 in the CAdE and 3970 in the standard group), with specific endpoints including advanced adenomas, serrated lesions, withdrawal time, and the influence of endoscopist experience.

Results

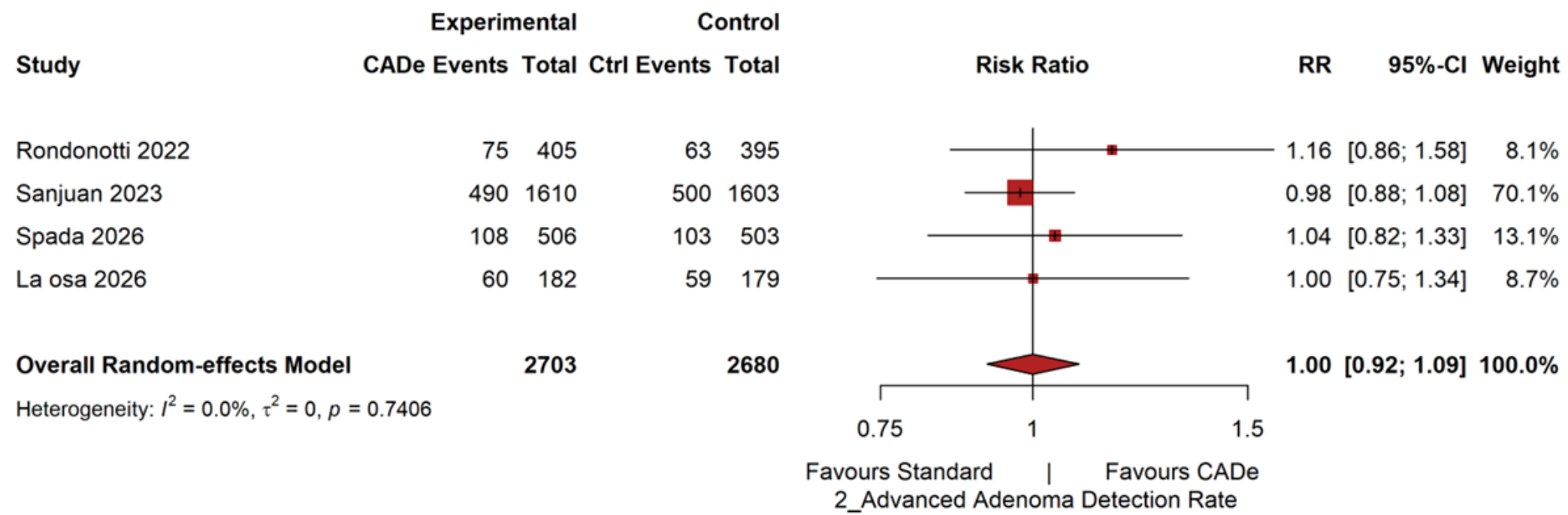
- Adenoma Detection Rate

Analysis of 14 RCTs demonstrated a significant increase in ADR with CADe (RR=1.15; 95% CI: 1.07-1.24, p=0.0002)



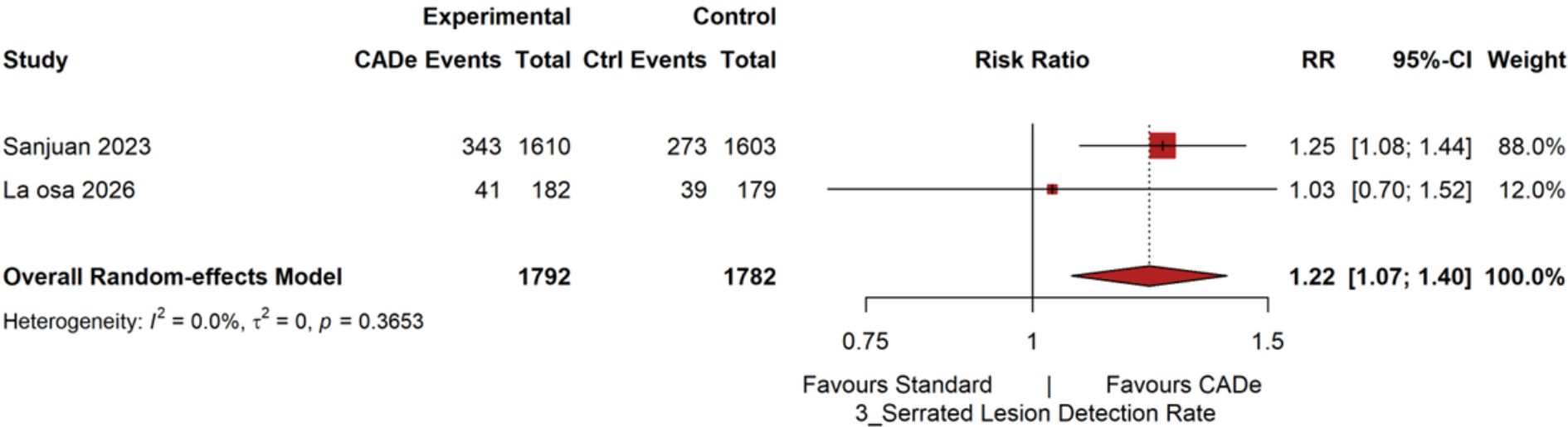
• **Advanced Adenoma Detection Rate**

A total of 4 studies were included in this analysis. The pooled estimate showed no significant difference between the CAdE and control groups, yielding an RR of 1.00 (95% CI: 0.92 to 1.09). No statistical heterogeneity was detected



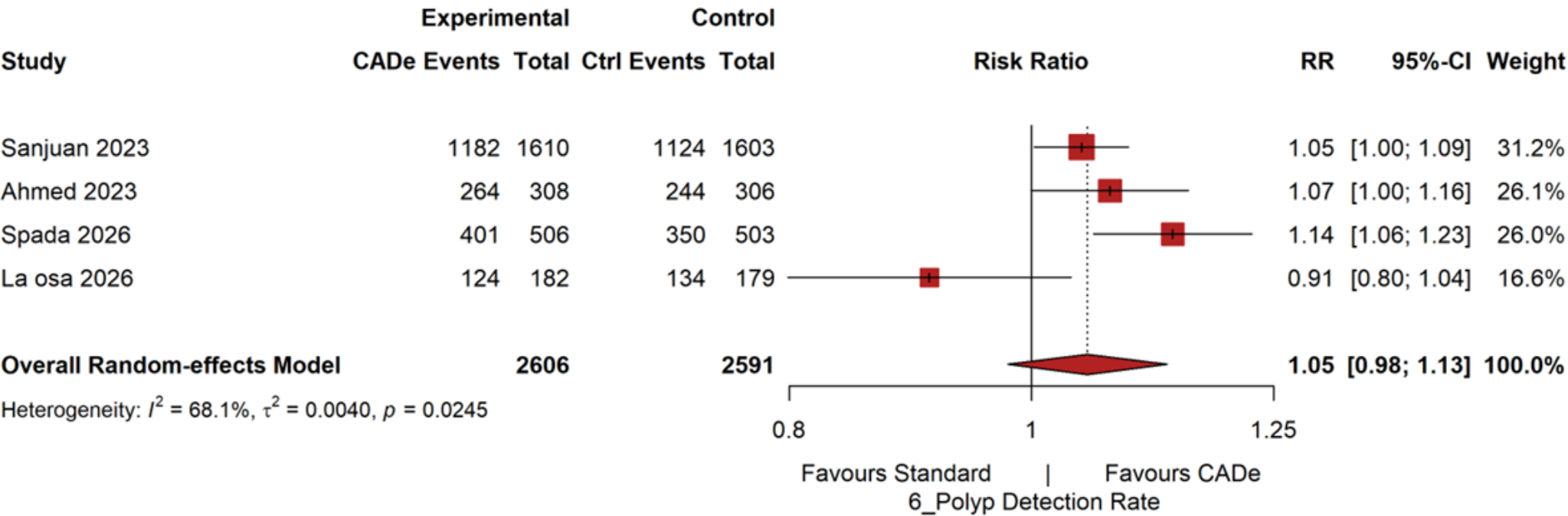
• **Serrated Lesion Detection Rate**

A total of 2 studies reported data on overall serrated lesion detection. The use of CADe was associated with a higher detection rate compared to standard colonoscopy (RR = 1.22; 95% CI: 1.07 to 1.40). The analysis demonstrated no statistical heterogeneity



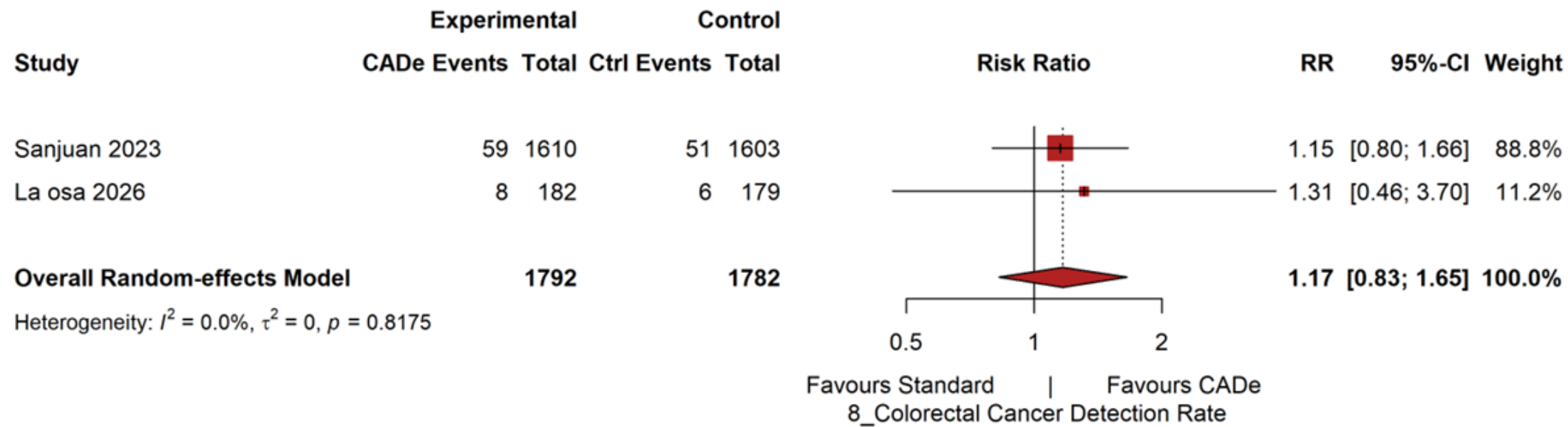
• Polyp Detection Rate

A total of 4 studies were included. The analysis yielded a non-significant pooled RR of 1.05 (95% CI: 0.98 to 1.13). Substantial heterogeneity was identified among the studies



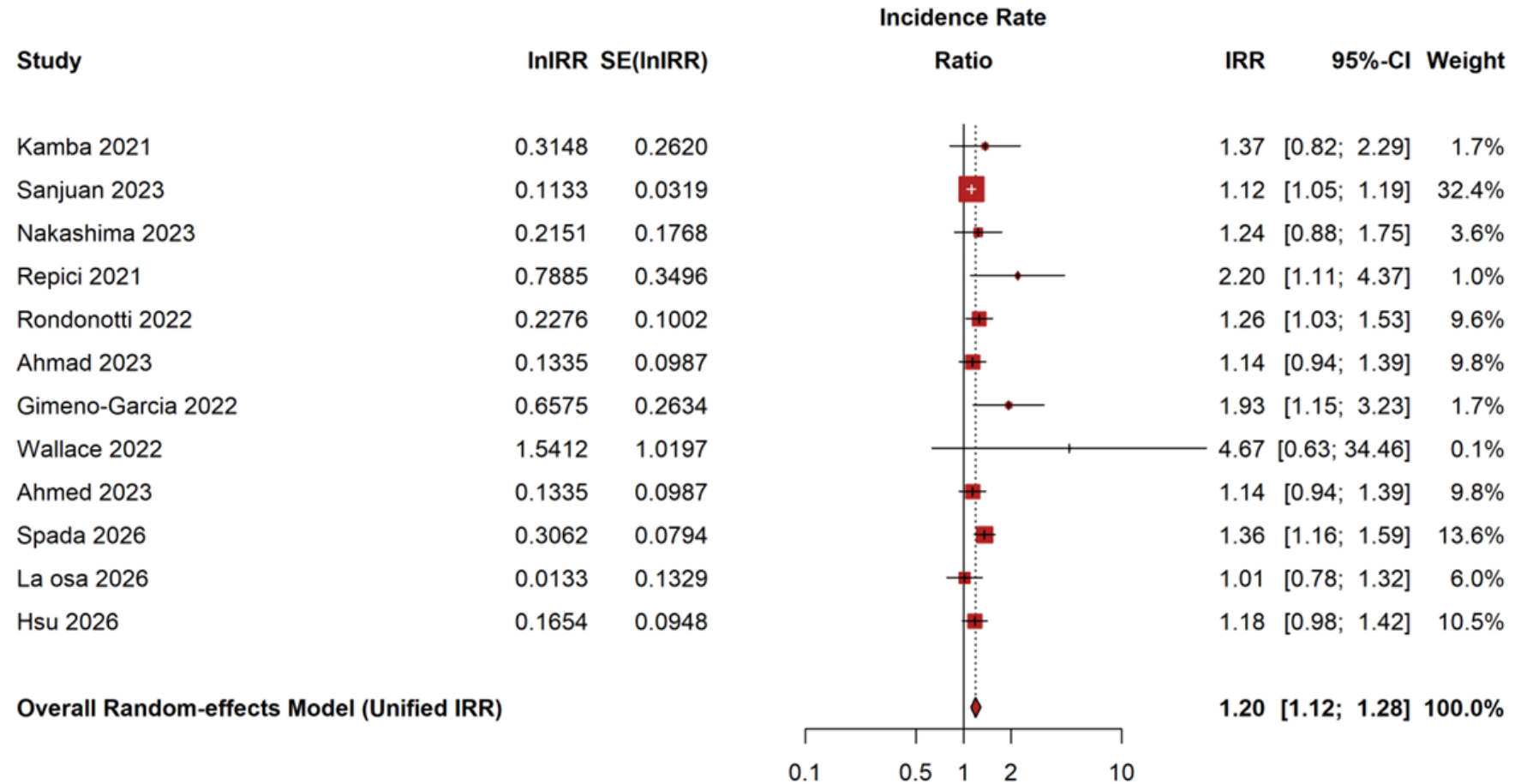
• Colorectal Cancer Detection Rate

A total of 2 studies were analyzed for colorectal cancer detection. The pooled analysis showed no significant advantage for the CADe group (RR = 1.17; 95% CI: 0.83 to 1.65). Heterogeneity was absent



Adenoma Per Colonoscopy (Unified)

A total of 12 studies were included in the unified incidence rate ratio analysis. CAdE significantly improved the adenoma per colonoscopy rate compared to the control group, demonstrating a pooled IRR of 1.20 (95% CI: 1.12 to 1.28,).

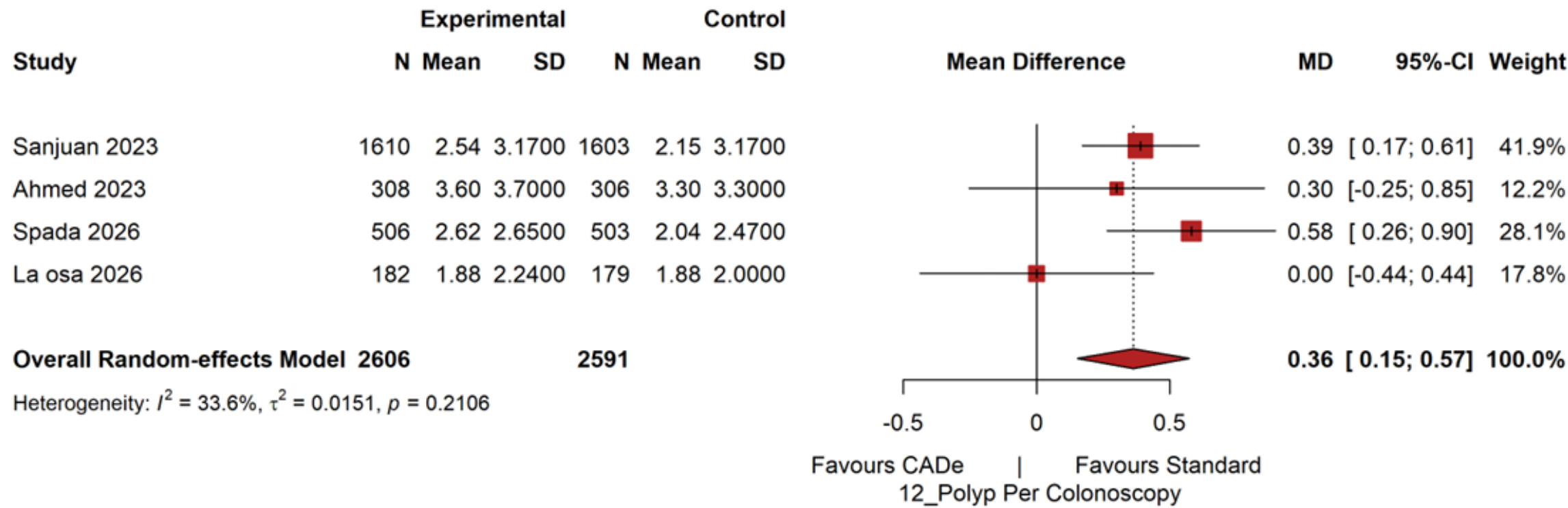


Heterogeneity: $I^2 = 32.7\%$, $\tau^2 = 0.0028$, $p = 0.1288$

Favours Standard | Favours CADe
11_Adenoma Per Colonoscopy Unified

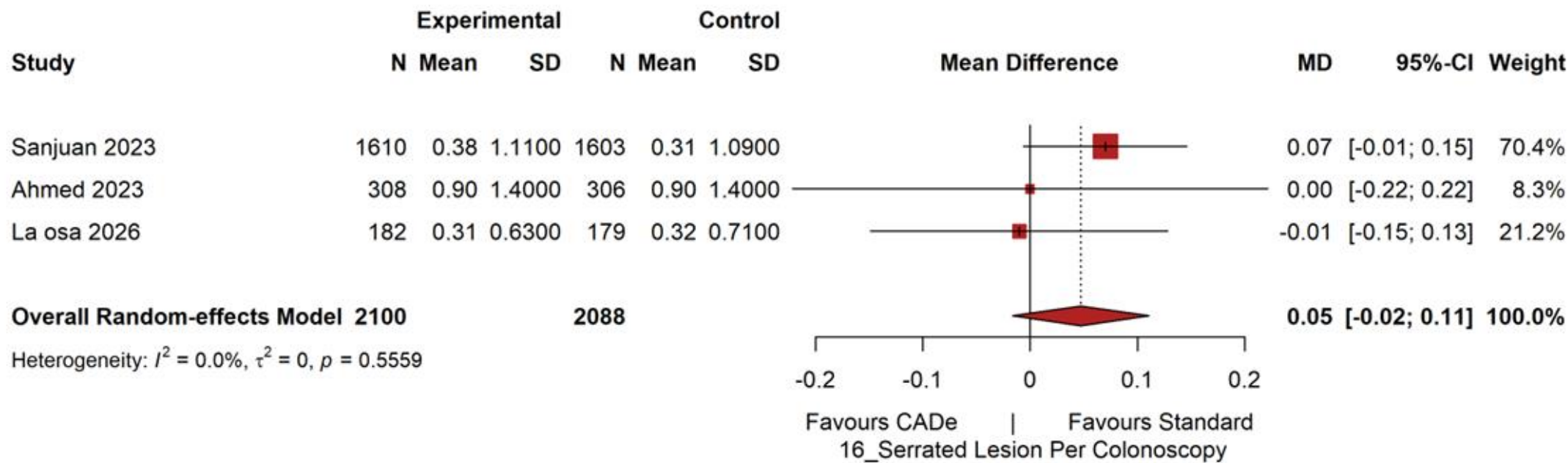
Polyp Per Colonoscopy

- A total of 4 studies reported on polyps per colonoscopy. The overall Mean Difference (MD) was significantly higher in the CADe group (MD = 0.36; 95% CI: 0.15 to 0.57). Minor heterogeneity was observed



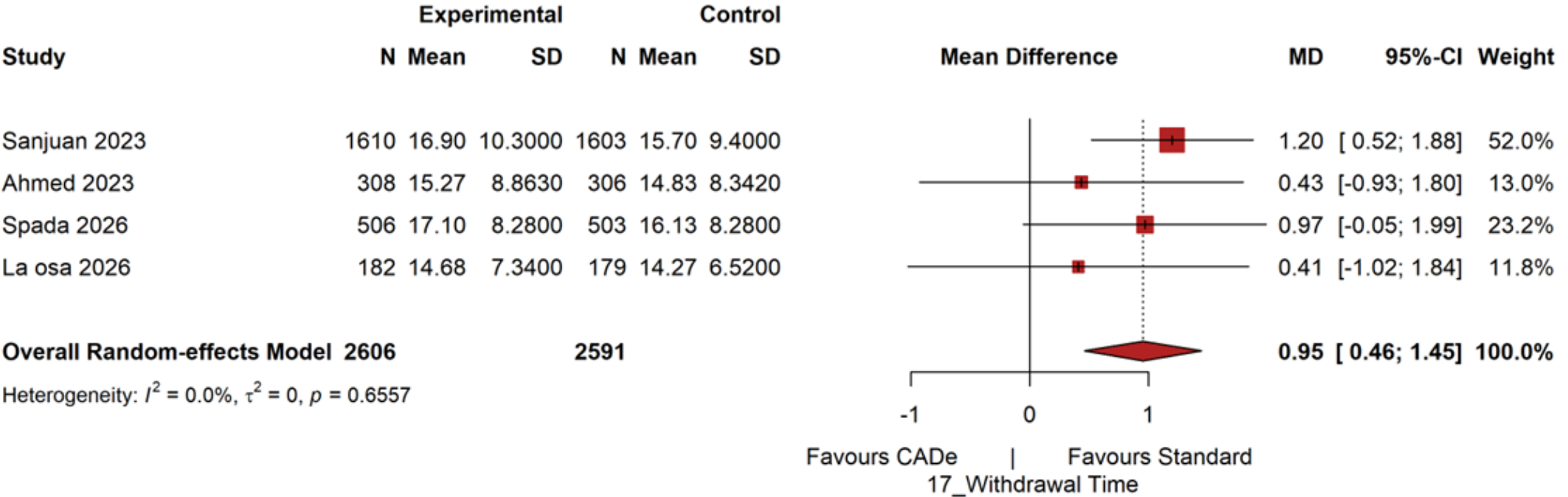
Serrated Lesion Per Colonoscopy

- A total of 3 studies provided data for this outcome. The pooled analysis showed a non-significant MD of 0.05 (95% CI: -0.02 to 0.11). The included studies were statistically homogeneous



Withdrawal Time

- A total of 4 studies reported withdrawal times. The CADe group was associated with a statistically significant increase in withdrawal time compared to the control group (MD = 0.95; 95% CI: 0.46 to 1.45). There was no statistical heterogeneity among the studies



Conclusions

- In contrast to prior meta-analyses that reported no significant impact on procedural duration, our updated analysis demonstrates a statistically significant prolongation of withdrawal time. While CAdE improves the detection of overall adenomas and serrated lesions, particularly for endoscopists with lower baseline ADR, it yields no benefit for advanced adenomas. These findings redefine the procedural trade-offs of CAdE in FIT-positive screening, establishing a definitive time penalty and demonstrating that AI assistance cannot substitute careful mucosal inspection for advanced neoplasia.

References

1. Morgan E, Arnold M, Gini A, et al. Global burden of colorectal cancer in 2020 and 2040: incidence and mortality estimates from GLOBOCAN. *Gut*. 2023;72(2):338-344. doi:10.1136/gutjnl-2022-327736
2. Bretthauer M, Løberg M, Wieszczy P, et al; NordICC Study Group. Effect of colonoscopy screening on risks of colorectal cancer and related death. *N Engl J Med*. 2022;387(17):1547-1556. doi:10.1056/NEJMoa2208375
3. Zhang Y, Song K, Zhou Y, et al. Accuracy and long-term effectiveness of established screening modalities and strategies in colorectal cancer screening: an umbrella review. *Int J Cancer*. 2025;157(1):126-138. doi:10.1002/ijc.35381
4. R. Bisschops, J. E. East, C. Hassan, et al., “Advanced Imaging for Detection and Differentiation of Colorectal Neoplasia: European Society of Gastrointestinal Endoscopy (ESGE) Guideline - Update 2019,” *Endoscopy* 51, no. 12 (2019): 1155–1179, <https://doi.org/10.1055/a-1031-7657>.
5. Zorzi M, Antonelli G, Barbiellini Amidei C et al. Adenoma detection rate and colorectal cancer risk in fecal immunochemical test screening programs: An observational cohort study. *Ann Intern Med* 2023; 176 (3): 303–10.
6. Wisse PHA, Erler NS, de Boer SY et al. Adenoma detection rate and risk for interval postcolonoscopy colorectal cancer in fecal immunochemical test–based screening. *Ann Intern Med* 2022; 175: 1366–73.
7. Repici A, Badalamenti M, Maselli R, Correale L, Radaelli F, Rondonotti E, et al. Efficacy of real-time computer-aided detection of colorectal neoplasia in a randomized trial. *Gastroenterology*. 2020;159(2):512–20.

27TH ANNUAL CONFERENCE OF
THE EGYPTIAN SOCIETY OF COLON & RECTAL SURGEONS

COLON & RECTAL



26 - 28 **AUG** 20
HILTON HELIOPOLIS 26

MANAGED BY
icom
GROUP
Business with Intelligence

Thank you

Ali Ramadan

Assiut University Hospital

For contact details

